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EUROPEAN PATENT SPECIFICATION

(12)

(54) **Optical filters**

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Description

This invention relates to optical filters and in particular to a filter in the form of a multi-layer coating on a substrate.

5   Various optical devices are concerned with transmitting radiation over a relatively broad spectrum but in certain fields of use, particularly military use, the broad spectrum encompasses one or more discrete wavelengths or narrow wavebands at which high energy radiation exists and there is a need to prevent such high energy radiation being transmitted through the optical device. In one example the optical device may be a pair of goggles (or spectacles) to be worn by a human observer and on the one hand there is a need
10   for the goggles to transmit radiation generally over the visible spectrum whilst on the other hand there is a need to protect the observers eyes from damaging laser radiation which may occur at one or more of at least three particularly-favoured laser radiation wavelengths.

According to the present invention there is provided an optical filter for inhibiting transmission of radiation at at least one wavelength which is known to be a laser wavelength in the form of a multi-layer
15   coating adherent to a substrate, said coating comprising a plurality of superimposed layer collections, said plurality being n in number where n is at least four, each layer collection consisting of ordered first second and third layers, said first and third layers each being made of a first optical coating material and having a thickness of substantially 0.6 quarter wavelengths at a predetermined wavelength, said second layer being made of a second optical coating material and having a thickness of substantially 6.8 quarter wavelengths at
20   said predetermined wavelength, one of said first and second optical coating materials having a high refractive index and the other of said optical coating materials having a low refractive index, whereby the coating is generally transmissive except in a plurality of narrow-waveband regions, said predetermined wavelength being selected so that at least one of said regions includes said known laser wavelength.

The number n may be in the range 4 to about 20 (being limited at the upper end of the range by
25   manufacturing processes) and the greater the value of n the less is the transmission within said narrow-waveband regions.

The first layer of each said layer collection may be composed of said high refractive index material. Alternatively the first layer of each said layer collection may be composed of said low refractive index material. Typical high refractive index optical coating materials have refractive indices in the range 1.9 to
30   2.5 and are: zinc sulphide, titania, certain rare earth oxides and certain sulphides and selenides. Typical low refractive index optical coating materials have refractive indices in the range 1.3 to 1.7 and are: thorium fluoride, silica, certain rare earth fluorides and certain oxides.

The optical filter of the present invention may be one of a pair of spaced filters separated by a medium which preferably possesses absorption properties as a result of which the combination exhibits improved
35   rejection efficiency within the narrow-waveband regions in comparison with a single coating with a given value of n. Also, in this arrangement it is preferred that each optical coating material possesses a small but finite degree of absorption since this attenuates multiple reflections between the coatings and improves the rejection efficiency within the narrow-waveband regions for a given value of n.

By virtue of the presence of said narrow-waveband regions the optical filter of the present invention
40   provides rejection of incident laser radiation. The rejection efficiency for normal incidence of the laser radiation on the filter is substantially maintained for incidence angles within a limited angular range the magnitude of which is determined by the width of the narrow-waveband region of the coating, because at non-normal incidence the coating characteristics effectively shift spectrally downwards in proportion to the angle of incidence.

45   The coating of the optical filter of the present invention may be index-matched to its adjoining media.

The filter of the present invention may incorporate a substrate in the form of a colour glass for rejecting a particular wavelength or narrow-waveband region to which the multi-layer coating is transmissive.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings which illustrate the transmission characteristics of different optical filters of the
50   present invention.

In a first embodiment the substrate is clear glass and the coating is composed of superimposed layer collections each of which has first and third layers made of zinc sulphide and a second layer made of thorium fluoride. The zinc sulphide layers are each 0.6 quarter wavelengths thick at a predetermined wavelength and the thorium fluoride layer is 6.8 quarter wavelengths thick at said predetermined
55   wavelength. A transmission characteristic of an optical filter is shown in Fig. 1 and at the three particularly-favoured laser radiation wavelengths of 0.532μm, 0.694μm, and 1.064μm the optical density of the filter provides effective blocking protection against transmission of laser radiation for a range of incidence angles of the order of ±22° with an overall transmission efficiency of the order of 50% elsewhere in the visible

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spectrum as measured by the conventional integrated visible photopic transmission factor F, where

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F = \frac{\int_{400}^{700} T(\lambda) . E(\lambda) . E(D_{65}) . d\lambda}{\int_{400}^{700} E(\lambda) . E(D_{65}) . d\lambda}
$$

$T(\lambda)$ being filter transmission with respect to wavelength λ;

$E(\lambda)$ being the photopic eye response as a function of wavelength λ;

$E(D_{65})$ being the response of the standard D_{65} illuminant as a function of wavelength λ.

More particular quantitative values for the filter of the first embodiment are set forth in Table I, the angular range values given being for simultaneous effective protection at the three laser radiation wavelengths.

In a second embodiment two filters of the Table I type are cemented together with a non-absorbing optical cement, namely Norland Inc. cement designation No. NOA61 and the combined filter arrangement displays improved characteristics as set forth in Table II, the angular range values given being for simultaneous effective protection at the three laser radiation wavelengths.

By way of example and with reference to the second embodiment utilising combined filters where the coating materials are free of absorption characteristics the improvement in optical density within the narrow-waveband region is relatively marginal (e.g. if the optical density of a filter is 4.0 the optical density of a combined filter is 4.3). If an absorption medium is utilised between the two filters, such as Schott NG 12 neutrally absorbing glass which has an absorption of about 10%, the optical density of the combined filter is 7.3. Where the optical coating materials of each filter possess an absorption of about 0.5%, as in the Table II embodiment, the optical density of the combined filter is 6.0. In both cases the overall transmission factor remains of the order of 40-50%.

In a third embodiment the materials are the same as in the first embodiment and the layer collections are the same in number but the first and third layers are made of thorium fluoride whilst the second layer is made of zinc sulphide. The thorium fluoride layers of the third embodiment are each 0.6 quarter wavelength thick at a wavelength of 0.543 µm and the zinc sulphide layers are each 6.8 quarter wavelengths thick at the same 0.543 µm wavelength. Quantitative values of transmission parameters are set forth in Table III for the third embodiment, and in comparison with the Table I values for the first embodiment it will be observed that there is very little difference. However the first embodiment has its angular performance limited by the coating behaviour at 0.532 µm whereas the third embodiment has its angular performance limited by the coating behaviour at 1.064 µm and colour glasses are readily available which are effectively non-transmitting at 1.064 µm but which are substantially fully transmitting at the visible region of the spectrum.

A fourth and preferred embodiment is therefore provided by the third embodiment modified by a colour glass, either as a substitute for or in addition to the clear glass substrate, of 2.5 mm thickness and made of LP3 colour glass (made and sold by Chance - Pilkington Ltd.). Quantitative values of transmission parameters are set forth in Table IV for the fourth embodiment and the transmission characteristic of this optical filter is shown in Fig. 2. It will be appreciated that the fourth embodiment provides substantially improved angular performance and provides effective blocking protection for a range of incidence angles of the order of ± 38° and overall transmission efficiency (F) of the order of 42%.

In a fifth embodiment two filters of the Table III type are cemented together with the same cement as in the second embodiment, and the combined filter arrangement displays the characteristics set forth in Table V.

In a sixth embodiment one filter of the Table III type and one filter of the Table IV type are cemented together with the same cement as in the second embodiment, and the combined filter arrangement displays the characteristics set forth in Table VI.

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Substrate	Optical Density			ANGULAR RANGE	IVPT %
	0.532μm	0.694μm	1.064μm		

TABLE I

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Clear glass	≥4.0	≥4.0	≥3.5	±20 to ±24°	45-55

TABLE II

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Clear glass	≥5.5	≥5.0	≥4.5	±23 to ±30°	40-50

TABLE III

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Clear glass	≥4.0	≥4.0	≥3.5	±22° to ±26°	42-52

TABLE IV

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Colour glass	≥4.0	≥4.0	≥6.0	±35° to ±40°	37-47

TABLE V

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Clear glass	≥5.0	≥5.0	≥4.0	±25° to ±30°	35-45

TABLE VI

Substrate	0.532μm	0.694μm	1.064μm	ANGULAR RANGE	IVPT %
Colour glass	≥5.0	≥5.0	≥6.0	±37° to ±42°	30-40

Claims

1. An optical filter for inhibiting transmission of radiation at at least one wavelength which is known to be a laser wavelength in the form of a multi-layer coating adherent to a substrate, said coating comprising a plurality of superimposed layer collections, said plurality being n in number where n is at least four, each layer collection consisting of ordered first second and third layers, said first and third layers each being made of a first optical coating material and having a thickness of substantially 0.6 quarter wavelengths at a predetermined wavelength, said second layer being made of a second optical coating material and having a thickness of substantially 6.8 quarter wavelengths at said predetermined wavelength, one of said first and second optical coating materials having a high refractive index and the other of said optical coating materials having a low refractive index, whereby the coating is generally transmissive except in a plurality of narrow-waveband regions, said predetermined wavelength being

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selected so that at least one of said regions includes said known laser wavelength.

2. An optical filter as claimed in claim 1, wherein said high refractive index material has a refractive index in the range 1.9 to 2.5 and said low refractive index material has a refractive index in the range 1.3 to 1.7.

3. An optical filter as claimed in either preceding claim, wherein said high refractive index material is zinc sulphide and said low refractive index material is thorium fluoride.

4. An optical filter as claimed in any one of claims 1-3, wherein the first layer of each said layer collection is composed of said high refractive index material.

5. An optical filter as claimed in any one of claims 1-3, wherein the first layer of each said layer collection is composed of said low refractive index material.

6. An optical filter as claimed in any preceding claim, wherein said substrate is made of clear glass.

7. An optical filter as claimed in any one of claims 1-5, wherein said substrate is made of colour glass for rejecting a narrow waveband region to which the multi-layer coating is transmissive.

8. An optical filter assembly comprising a pair of spaced optical filters each as claimed in claim 1 and separated by a medium having absorption properties.

Patentansprüche

1. Optisches Filter zur Unterbindung der Übertragung von Strahlung bei wenigstens einer Wellenlänge, die als eine Laser-Wellenlänge bekannt ist, in Form eines mehrschichtigen Überzugs, der an einem Substrat haftet, wobei der Überzug eine Vielzahl von sich überlagernden Schichtansammlungen umfaßt, wobei die Vielzahl gleich der Zahl $\underline{n}$ ist, wenn $\underline{n}$ wenigstens gleich vier ist, wobei jede Schichtansammlung aus geordneten ersten, zweiten und dritten Schichten besteht, wobei die erste und die dritte Schicht jeweils aus einem ersten optischen Beschichtungsmaterial hergestellt werden und eine Stärke von im wesentlichen 0,6 Viertelwellenlängen bei einer festgelegten Wellenlänge haben, wobei die zweite Schicht aus einem zweiten optischen Beschichtungsmaterial herstellt wird und eine Stärke von im wesentlichen 6,8 Viertelwellenlängen bei der festgelegten Wellenlänge hat, wobei eines der ersten und der zweiten optischen Beschichtsmaterialien einen hohen Brechungskoeffizienten hat und das andere der optischen Beschichtungsmaterialien einen niedrigen Brechungskoeffizienten hat, wodurch der Überzug allgemein durchlässig ist, ausgenommen eine Vielzahl von schmalbandigen Wellenbereichen, wobei die festgelegte Wellenlänge so ausgewählt wird, daß wenigstens einer der Bereiche die bekannte Laser-Wellenlänge einschließt.

2. Optisches Filter nach Anspruch 1, bei dem das Material mit dem hohen Brechungskoeffizienten einen Brechungskoeffizienten im Bereich von 1,9 bis 2,5 hat und das Material mit dem niedrigen Brechungskoeffizienten einen Brechungskoeffizienten im Bereich von 1,3 bis 1,7 hat.

3. Optisches Filter nach einem der vorhergehenden Ansprüche, bei dem das Material mit dem hohen Brechungskoeffizienten Zinksulfid ist und das Material mit dem niedrigen Brechungskoeffizienten Thoriumfluorid ist.

4. Optisches Filter nach einem der Ansprüche 1 bis 3, bei dem sich die erste Schicht jeder der Schichtansammlungen aus dem Material mit dem hohen Brechungskoeffizienten zusammensetzt.

5. Optisches Filter nach einem der Ansprüche 1 bis 3, bei dem sich die erste Schicht jeder der Schichtansammlungen aus dem Material mit dem niedrigen Brechungskoeffizienten zusammensetzt.

6. Optisches Filter nach einem der vorhergehenden Ansprüche, bei dem das Substrat aus farblosem Glas hergestellt wird.
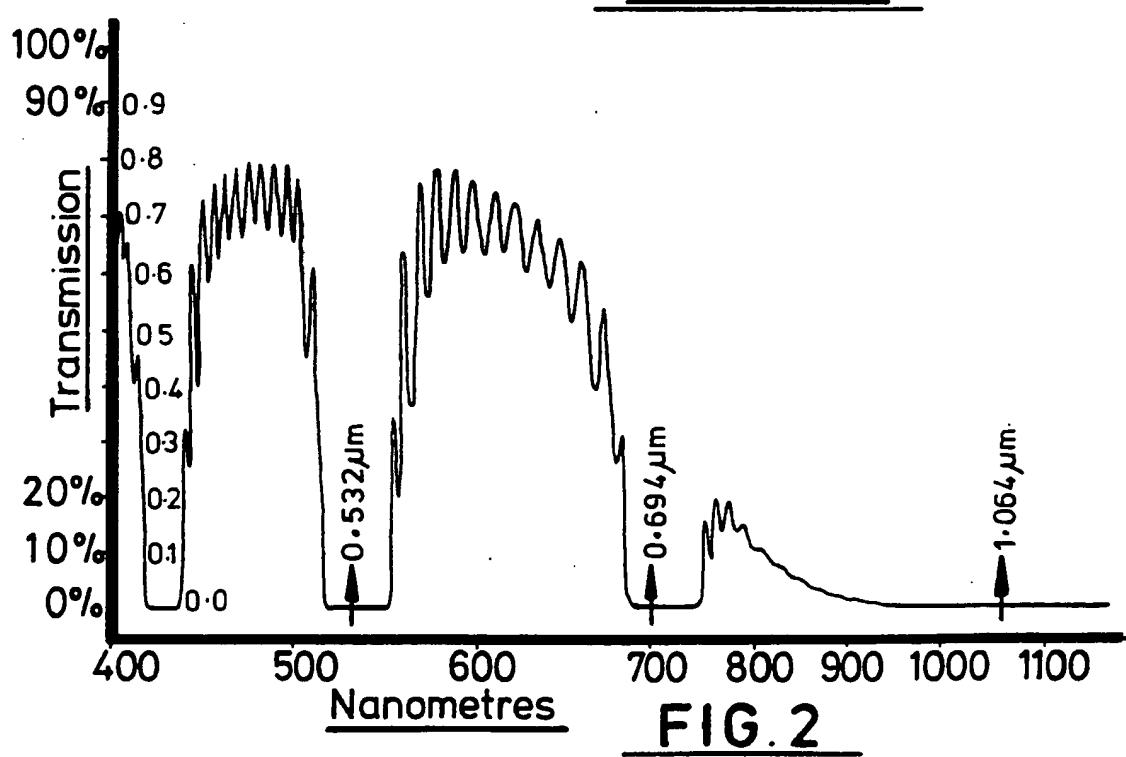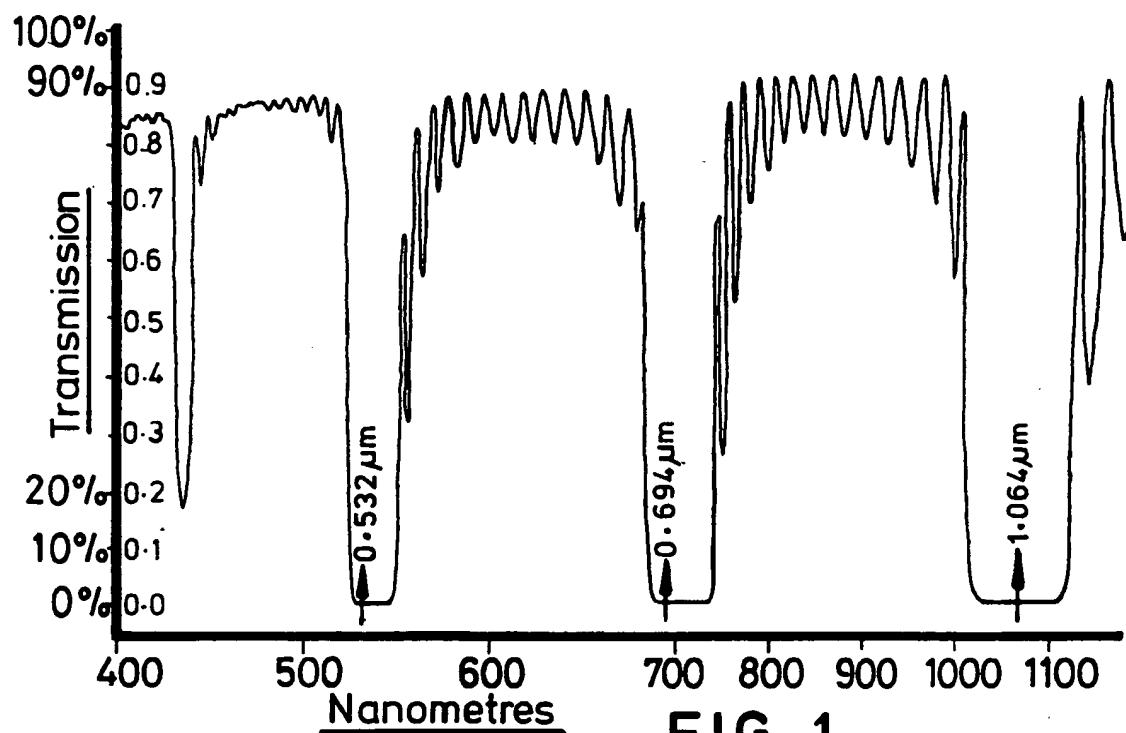
7. Optisches Filter nach einem der Ansprüche 1 bis 5, bei dem das Substrat aus Farbglas hergestellt wird, das einen schmalen Wellenband-Bereich zurückweist, für den der mehrschichtige Überzug durchlässig ist.

5 8. Optische Filterbaugruppe, die ein Paar im Abstand zueinander angeordneter optischer Filter jeweils nach Anspruch 1 aufweist und die durch ein Medium mit Absorptionseigenschaften voneinander getrennt sind.

Revendications

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1. Filtre optique pour empêcher la transmission d'un rayonnement à au moins une longueur d'onde, connue comme étant une longueur d'onde de laser, sous forme d'un revêtement à couches multiples adhérent à un substrat, ledit revêtement comprenant une pluralité de collections de couches superposées, ladite pluralité étant au nombre de n, n correspondant au moins à quatre, chaque collection de
15 couches étant composée de premières, deuxièmes et troisièmes couches ordonnées, lesdites premières et troisièmes couches étant chacune composée d'un premier matériau de revêtement optique et ayant une épaisseur représentant pratiquement 0,6 quarts de longueurs d'onde à une longueur d'onde prédéterminée, ladite deuxième couche étant composée d'un deuxième matériau de revêtement optique et ayant une épaisseur représentant pratiquement 6,8 quarts de longueurs d'ondes à ladite
20 longueur d'onde prédéterminée, l'un desdits premier et deuxième matériaux de revêtement optique présentant un indice de réfraction élevé et l'autre desdits matériaux de revêtement optique présentant un faible indice de réfraction, le revêtement étant en général transmissif, sauf dans plusieurs régions à bande d'ondes étroite, ladite longueur d'ondes prédéterminée étant sélectionnée de sorte qu'au moins une desdites régions englobe ladite longueur d'onde de laser connue.

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2. Filtre optique selon la revendication 1, dans lequel ledit matériau à indice de réfraction élevé a un indice de réfraction compris dans l'intervalle allant de 1,9 à 2,5, ledit matériau à faible indice de réfraction ayant un indice de réfraction compris dans l'intervalle allant de 1,3 à 1,7.

30 3. Filtre optique selon l'une quelconque des revendications précédentes, dans lequel ledit matériau à indice de réfraction élevé est du sulfure de zinc, ledit matériau à faible indice de réfraction étant du fluorure de thorium.

4. Filtre optique selon l'une quelconque des revendications 1 à 3, dans lequel la première couche de
35 chacune desdites collections de couches est composée dudit matériau à indice de réfraction élevé.

5. Filtre optique selon l'une quelconque des revendications 1 à 3, dans lequel la première couche de chacune desdites collections e couches est composée dudit matériau à faible indice de réfraction.

40 6. Filtre optique selon l'une quelconque des revendications précédentes, dans lequel ledit substrat est composé de verre clair.

7. Filtre optique selon l'une quelconque des revendications 1 à 5, dans lequel ledit substrat est composé de verre de couleur pour rejeter une région à bande d'onde étroite vers laquelle le revêtement à
45 couches multiples est transmissif.

8. Assemblage de filtre optique comprenant une paire de filtres optiques espacés, chacun selon la revendication 1, et séparés par un matériau ayant des propriétés d'absorption.

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FIG.1

FIG.2

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U.S. Patent 6,658,418

Prior art: <DESCRIPTION>

Relevant documents:
[A] <DOCS>.

<COMMENTS>.

Claim	<PRIOR ART SYSTEM>
1. A method for providing customized assortment of information content from a plurality of information providers for display in one or more customized interface screens in a plurality of computers, comprising:	
[1a] enabling selection of a customized assortment of information content from information content from said plurality of information providers;	
[1b] enabling selection of at least one interface screen element from a plurality of pre-defined interface screen elements for inclusion in said customized interface screens,	
[1c] said screen elements having on-screen characteristics subject to pre-defined constraints providing a generally uniform look and feel with other interface screens of said plurality of computers; and	
[1d] associating a selection of a customized assortment of information content for a first computer of said plurality and a selection of at least one screen element for said first computer for display on said first computer in said one or more customized interface screens.	

2. The method of claim 1 wherein said plurality of pre-defined interface screen elements includes at least one of a window object, a button object, a text object, a video object, an animation object, an image object, or a hotspot.	
3. The method of claim 1 wherein at least one of said pre-defined interface screen elements provides for variation in one or more of the on-screen characteristics thereof in conformity with said pre-defined constraints and said method further comprises:	
[3a] enabling selection of said one or more on-screen characteristics.	
4. The method of claim 3 wherein the one or more variable on-screen characteristics include at least one of a location, a size, a style of a control, a foreground color, a background color, a border style, or a font type.	
5. The method of claim 4 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at said first computer.	
see 53. dependent on 5.	
6. The method of claim 1 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	
see 57.-58. dependent on 6.	

7. The method of claim 1 wherein said information content from said information providers is referenced from a data structure.	
8. The method of claim 7 wherein said data structure comprises a plurality of related tables.	
see 54.-55. dependent on 7.	
9. The method of claim 1 further comprising enabling selection of an association of at least a portion of said customized information content with at least one of the selected interface screen elements.	
see 56 dependent on 9.	
10. The method of claim 1 wherein said plurality of pre-defined interface screen elements and said information content from said plurality of information providers are provided by a server.	
11. The method of claim 10 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at said first computer.	
12. The method of claim 10 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	
see 59.-69. dependent on 10; *see 47-52 dependent on 1.*	

U.S. Patent 6,658,418	<PRIOR ART SYSTEM>
13. A method for providing customized assortment of information content from a plurality of information providers for display in one or more customized interface screens in a plurality of computers, comprising:	see 1. without "associating a selection …" clause
[13a] selecting a customized assortment of information content for a first computer of said plurality from information content from said plurality of information providers; and	see 1a. "enabling selecting" -> "selecting"; adds "for a first computer …"
[13b] selecting at least one interface screen element for said first computer from a plurality of pre-defined interface screen elements for inclusion in said customized interface screens,	see 1b.
[13c] said screen elements having on-screen characteristics subject to pre-defined constraints providing a generally uniform look and feel with other customized interface screens of said plurality of computers.	see 1c.
14. The method of claim 13 wherein said plurality of pre-defined interface screen elements includes at least one of a window object, a button object, a text object, a video object, an animation object, an image object, or a hotspot.	see 2.
15. The method of claim 13 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are performed at said first computer.	see 5.
16. The method of claim 13 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are performed at a different computer from said first computer.	see 6.

17. The method of claim 13, further comprising selecting a plurality of interface screen elements for said first computer.	
18. The method of claim 17 wherein the selection of said customized assortment of information content and the selection of said plurality of interface screen elements are performed at said first computer.	see 5.
19. The method of claim 17 wherein the selection of said customized assortment of information content and the selection of said plurality of interface screen elements are performed at a different computer from said first computer.	see 6.
20. The method of claim 13 wherein said customized assortment of information content is selected from information content provided by a server and wherein said at least one interface screen element is selected from said plurality of pre-defined interface screen elements provided by said server.	
21. The method of claim 20 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are performed at said first computer.	see 5.
22. The method of claim 20 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are performed at a different computer from said first computer.	see 6.
23. The method of claim 20 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are performed at said server.	

see 62 dependent on 20;		
see 61 dependent on 13.		
24. A computer program storage medium readable by a computing system and encoding a computer program for executing a computer process for providing customized assortment of information content from a plurality of information providers for display in one or more customized interface screens in a plurality of computers, comprising:	see 1; 13 + "associating a selection…"	
[24a] enabling selection of a customized assortment of information content from information content from said plurality of information providers;	see 1a; 13a	
[24b] enabling selection of at least one interface screen element from a plurality of pre-defined interface screen elements for inclusion in said customized interface screens,	see 1b; 13b	
[24c] said screen elements having on-screen characteristics subject to pre-defined constraints providing a generally uniform look and feel with other interface screens of said plurality of computers; and	see 1c; 13c	
[24d] associating a selection of a customized assortment of information content for a first computer of said plurality and a selection of at least one screen element for said first computer for display on said first computer in said customized interface screens.	see 1d.	

25. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes at least one of a window object, a button object, a text object, a video object, an animation object, an image object, or a hotspot.	see 2; 14
26. The computer program storage medium of claim 24 wherein at least one of said pre-defined interface screen elements provides for variation in one or more of the on-screen characteristics thereof in conformity with said pre-defined constraints and said computer process further comprises:	see 3.
[26a] enabling selection of said one or more on-screen characteristics.	see 3a.
27. The computer program storage medium of claim 26 wherein the one or more variable on-screen characteristics include at least one of a location, a size, a style of a control, a foreground color, a background color, a border style, or a font type.	see 4.
see 74 dependent on 26.	
28. The computer program storage medium of claim 24 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at said first computer.	see 5; 18
29. The computer program storage medium of claim 24 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	see 6; 19

30. The computer program storage medium of claim 24 wherein said information content from said information providers is referenced from a data structure.	see 7.
31. The computer program storage medium of claim 30 wherein said data structure comprises a plurality of related tables.	see 8.
see 75-76 dependent on 30.	
32. The computer program storage medium of claim 24 wherein said computer process further comprises enabling selection of an association of at least a portion of said customized information content with at least one of the selected interface screen elements.	see 9.
see 77-79 dependent on 32.	
33. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements and said information content from said plurality of information providers are provided by a server.	see 10.
34. The computer program storage medium of claim 33 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at said first computer.	see 11.
35. The computer program storage medium of claim 33 wherein selection of said customized assortment of information content and selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	see 12.
see 63-73 dependent on 24.	

36. A computer program storage medium readable by a computing system and encoding a computer program for executing a computer process for providing customized assortment of information content from a plurality of information providers for display in one or more customized interface screens in a plurality of computers, the computer process comprising:	see 13. see 1, 24 without clause 24d "associating a selection".
[36a] enabling selection of said a customized assortment of information content for a first computer of said plurality from information content from said plurality of information providers; and	see 1a, 13a, 24a.
[36b] enabling selection of at least one interface screen element for said first computer from a plurality of pre-defined interface screen elements for inclusion in said customized interface screens,	see 1b, 13b, 24b
[36c] said screen elements having on-screen characteristics subject to pre-defined constraints providing a generally uniform look and feel with other customized interface screens of said plurality of computers.	see 1c, 13c, 24c.
37. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes at least one of a window object, a button object, a text object, a video object, an animation object, an image object, or a hotspot.	see 2, 14, 25.
38. The computer program storage medium of claim 36 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are enabled to be performed at said first computer.	see 5, 15 + "enabled to be..."; 28

39. The computer program storage medium of claim 36 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	see 6, 16 + "enabled to be"
40. The computer program storage medium of claim 36, said computer process further comprising enabling selection of a plurality of interface screen elements for said first computer.	see 17 + "enabling selection"
41. The computer program storage medium of claim 40 wherein the selection of said customized assortment of information content and the selection of said plurality of interface screen elements are enabled to be performed at said first computer.	see 5, 18 + "enabled to ..."
42. The computer program storage medium of claim 40 wherein the selection of said customized assortment of information content and the selection of said plurality of interface screen elements are enabled to be performed at a different computer from said first computer.	see 6, 19
43. The computer program storage medium of claim 36 wherein said customized assortment of information content is enabled to be selected from information content provided by a server and wherein said at least one interface screen element is enabled to be selected from said plurality of pre-defined interface screen elements provided by said server.	see 20
44. The computer program storage medium of claim 43 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are enabled to be performed at said first computer.	see 5, 21

45. The computer program storage medium of claim 43 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are enabled to be performed at a different computer from said first computer.	see 6, 22
46. The computer program storage medium of claim 43 wherein the selection of said customized assortment of information content and the selection of said at least one interface screen element are enabled to be performed at said server.	see 23
47. The method of claim 1 wherein said selection of a customized assortment of information content and said selection of said at least one interface screen element are enabled to be performed over a global computer network.	
48. The method of claim 1 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained on said first computer.	
49. The method of claim 1 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained on a different computer from said first computer.	
50. The method of claim 1 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained in a data structure.	

51. The method of claim 50 wherein said data structure comprises a plurality of related tables.	
52. The method of claim 50 wherein said selection of said one or more on-screen characteristics is maintained in said data structure.	
53. The method of claim 3 wherein said plurality of pre-defined interface screen elements includes a window object, said method further comprising: enabling selection of a background color as an on-screen characteristic of said window object.	
54. The method of claim 7 wherein said plurality of pre-defined interface screen elements are referenced from said data structure.	
55. The method of claim 54 wherein said data structure comprises a plurality of related tables.	
56. The method of claim 9 wherein said association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained in a data structure.	
57. The method of claim 6 wherein said selection of said one or more on-screen characteristics is maintained in said data structure.	
58. The method of claim 57 wherein said data structure comprises a plurality of related tables.	

59. The method of claim 10 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained on said server.	
60. The method of claim 10 wherein said plurality of pre-defined interface screen elements and said information content from said plurality of information providers are provided by said server over a global computer network.	
61. The method of claim 13 wherein said selection of a customized assortment of information content and said selection of said at least one interface screen element are enabled to be performed over a global computer network.	see 47
62. The method of claim 20 wherein the selected customized assortment of information content and the selected at least one interface screen element are provided by said server over a global computer network.	see 60.
63. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes a window object.	see 2, 14, 25 for "window object"
64. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes at least one of a button object.	see 2, 14, 25 for "button object"

65. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes a text object.	see 2, 14, 25 for "text object"
66. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes a video object.	see 2, 14, 25 for "video object"
67. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes an animation object.	see 2, 14, 25 for "animation object"
68. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes an image object.	see 2, 14, 25 for "image object"
69. The computer program storage medium of claim 24 wherein said plurality of pre-defined interface screen elements includes a hotspot.	see 2, 14, 25 for "hotspot"
70. The computer program storage medium of claim 24 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained on said first computer.	see 48.
71. The computer program storage medium of claim 24 wherein the association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained on a different computer from said first computer.	see 49.

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72. The computer program storage medium of claim 24 wherein said association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained in a data structure.	see 50.
73. The computer program storage medium of claim 72 wherein said data structure comprises a plurality of related tables.	see 51.
74. The computer program storage medium of claim 26 wherein said plurality of pre-defined interface screen elements includes a window object and said computer process further comprises:	see 53.
enabling selection of a background color as an on-screen characteristic of said window object.	see 53a.
75. The computer program storage medium of claim 30 wherein said plurality of pre-defined interface screen elements are referenced from said data structure.	see 54.
76. The computer program storage medium of claim 75 wherein said data structure comprises a plurality of related tables.	see 55.
77. The computer program storage medium of claim 32 wherein said association of said selection of a customized assortment of information content and said selection of at least one screen element is maintained in a data structure.	see 56.
78. The computer program storage medium of claim 77 wherein said selection of said one or more on-screen characteristics is maintained in said data structure.	see 57.
79. The computer program storage medium of claim 78 wherein said data structure comprises a plurality of related tables.	see 58.

80. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes a window object.	see 63; 2, 14, 25 for "window object"
81. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes at least one of a button object.	see 64; 2, 14, 25 for "button object"
82. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes a text object.	see 65; 2, 14, 25 for "text object"
83. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes a video object.	see 66; 2, 14, 25 for "video object"
84. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes an animation object.	see 67; 2, 14, 25 for "animation object"
85. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes an image object.	see 68; 2, 14, 25 for "image object"
86. The computer program storage medium of claim 36 wherein said plurality of pre-defined interface screen elements includes a hotspot.	see 69; 2, 14, 25 for "hotspot"

Claim Chart for 418 Patent.doc